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THE SANITARY POWERS
OF
THE IRON-SPRINGS OF SCHWALBACH.

A BALNEOLOGICAL ESSAY

BY

RUDOLPH BIRNBAUM, M. D.

PHYSICIAN IN SCHWALBACH.

TRANSLATED BY THE AUTHOR.



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PREFACE.

THE following sheets, published a year ago in German are offered to-day by their author to his English colleagues.

Not intending to give either a full account of the general effects of ferruginous waters or a complete description of the country favoured with the gift of these wonderful springs, the writer contents himself in explaining what he has observed in his own experience of the effects of the iron-waters of Schwalbach.

Some short casuistical remarks are only given where they seemed indispensable to the purpose of this work.

Bad Schwalbach (Prussian Province Hessen-Nassau),
January 1876.

DR. BIRNBAUM.

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CHAPTER I.

INTRODUCTION.

*"In ferro est aliquid divinum,
sed nunquam praeparata ejus
artificialia id operantur, quod
acidulae martiales."*

BOERHAVE.

THE chemical and physical effects of mineral waters have been discussed frequently and not without useful consequences for our balneological science during the last forty years; though very different opinions were brought forth about this matter, the author of the following essay, thinking them to be completely known by all learned physicians, restricts himself to publishing what he saw of the use and effect of the cold iron-waters of Schwalbach during the time he has attended invalids there and to explaining as shortly as possible those principles which governed him in the application of the above named springs.

A. THE BATHS IN SCHWALBACH

are prepared in such a way that the cold iron-water coming out of the springs is immediately directed into

double-bottomed bathing-tubs and then hot steam is brought into the space between the two bottoms of the tubs (method invented by Dr. Schwarz); hence it is evident that there is no loss of the great quantity of carbonic-acid-gas, which, suspended in the water, must be considered as the principal therapeutical agent of the baths of Schwalbach.

In order to observe their effects upon a healthy body, I myself often took baths, taking care, never to prolong them beyond the time of fifteen minutes. The water was warmed from eighty-one to ninety degrees Fahrenheit. Covering the whole surface of the tub, save the place where my head surmounted the water, I prevented the inhalation of carbonic-acid-gas through the lungs; and these were the ordinary effects:

After a quick passing chill the whole body soon rejoices in an agreeable warmth; the bathers skin is reddened and as long as he sits quiet in the water it is covered all over with small vesicles of carbonic-acid-gas, which soon produce an intense feeling of pricking and burning. By degrees the muscular elements of the skin become contracted and make it appear slightly wrinkled. There is no change in the movements of pulse and respiration in the beginning of the bath: but at its end both the circulation of blood and the respiration are somewhat quickened. The perspiration is a little more increased than in ordinary-water-baths. Immediately after the bath you will feel an agreeable sensation of elasticity, a feeling, which by intelligent patients has often been compared to walking in rarified air.

Quite different is the effect of an uncovered bath, the carbonic-acid-gas being allowed to enter into the bathers lungs. This gas, whether it enters through the skin or the lungs, works so effectually that after six or seven [in few cases more than twelve] baths—even when covered—it is followed by a general feeling of weariness and fatigue:—To rest a day abstaining from the use of the spa both in bathing and drinking, is quite sufficient to restore the body. On this account I think it necessary to take care that my patients take their baths with intervals, so that the body is allowed to recover from the unaccustomed influences to which it has been exposed. In cases where these precautions were not followed, I often saw the bad consequences of their neglect.

The patients (as they often do, directed by their own ideas) prolonging their baths beyond the reasonable time and drinking as much as possible of the strongest spa (that is the one which contains the greatest amount of iron) find, after having done thus for some days, that they feel sick and weary and that they have an exceedingly annoying headache which produces symptoms of dizziness and fainting. Against these accidents, which are effected by the abuse of the carbonic-acid-gas, I always ordered with never failing success complete rest with the application of ice—compresses upon the head and small pieces of cracked ice taken every four or five minutes.

After this indispensable digression, I return to the main-subject, which is to show, what is the real

effect of the Schwalbach-mineral-baths? Before considering this, I must make the following remark:

That any iron enters the skin during a bath be it in warm or cold iron-water has been denied by our physiological experiments; not even by the mucous membranes, even that of the vagina, can any amount of iron, which would be useful for the economy of the whole body, enter into the blood.

The quantity of the other chemical components of the Schwalbachian Spa being only very small, I think their effect too unimportant to be mentioned here at all.

From all these observations it is evident that the mineral baths of Schwalbach have the simple effect of increasing the functions of the skin and lungs and heart—that is to say of the chief-active powers which direct the constructive and destructive metamorphosis of the body.

On account of this effect they must be considered as welcome and indispensable remedies for all those diseases which, characterised by a disturbance of nutrition, are to be discussed in the following pages.

B. THE DRINKING CURE.

All our experience proves that the decision of our most celebrated physician FRERICHS is correct: namely that the faculty of the stomach to digest iron in any form is limited to a very small quantity, and that, as often as there has been brought into it a quantity of

iron beyond the said faculty, the whole of it could be found afterwards blackening the stools and evacuated from the bowels without benefiting the body. For this reason we always thought, that the first principle to be observed in the use of all the different iron-waters of Schwalbach as well as of the others should be the question, in what form the said springs contain the iron rather, than how much of it they contain.

The quantity of bicarbonate of protoxyde of iron, which is found in all the mineral springs of Schwalbach, has been proved to be quite sufficient for medical use.

The other chemical components mixed with the iron in the water are so insignificant that these springs hold the very first place among similar ones on account of their simplicity, nor is there anything in the spa, which could be regarded as hurtful for digestion.

Of all the springs of Schwalbach the "*Stahlbrunnen*" and the "*Weinbrunnen*" differ the most in their chemical composition, 1000 parts of the first containing 0,0837 parts of iron among 3,588601 fixed constituents, while in 1000 parts of the other there are 4,269261 fixed elements with only 0,0578 parts of iron.

These different qualities being of the greatest consequence for the employment of both of them in every individual case, I restrict myself to remarking generally that, wherever there is observed in a patient any inclination to constipation, the Weinbrunnen-water, while on the contrary, where the opening effect of the bi-

carbonates of alkalis must be avoided, the use of the Stahlbrunnen will be indicated, on account of its astringent effect.

As the low temperature of our springs cannot but offend the stomach and since the quantity of iron is not thought to be lessened by warming the water to 75 degrees Fahrenheit, I always order my patients to take it warmed by the addition of some warm water. (Here ordinary water is best because mineral water if heated, is discolored).

Although our iron-remedies seem to be digested best when taken shortly before or after meals, experience teaches us here, that our strong spa is better taken in the morning before another heavy task has been imposed upon the stomach. But on the other side I do not think it right to drive a person, whose nervous system is in a continual state of excitement and who sleeps best in the morning, out off his bed, ordering him to pump cold iron-water into his stomach, at a time when at home he was in the habit of still slumbering. It would be better to tell such a man to rise a little earlier day by day and to take a small cup of orange-blossoms-tea or milk half-an-hour before drinking the spa.

Finally I never allow such a person whose sleep is easily troubled, to take iron-water late in the afternoon.

The Weinbrunnen and Stahlbrunnen being the only springs, the water of which is usually drunk

by patients I think it proper to give their complete analysis in Table I. In the other springs, that are used for bathing, it is only the carbonic-acid-gas suspended in them, which can excite our interest: therefore Table II. shows comparatively the amount of this gas in each of the eight springs.*)

*) Referring to R. FRESENIUS, chemical anal. of the springs of Schwalbach.

TABLE I.

In 1000 parts (of a temperature of 47 degr. Fahr.)

the Stahlbrunnen	the Weinbrunnen	contains:
0,083770	0,057801	bicarbon. of protox. of iron,
0,018417	0,009085	» » » of manganese,
0,020623	0,245345	» » » of soda,
0,221309	0,572129	» » » of calcium,
0,212233	0,605120	» » » of magnesia,
0,007922	0,006193	Sulfate of soda,
0,003746	0,007469	» of potassium,
0,006723	0,008630	Chlorate of sodium,
0,032070	0,046500	Silica,
2,981672	2,710873	Free carbon. acid.
0,000116	0,000116	Sulfuretted hydrogen.
3,588601	4,269261	Fixed elements.

Beside these the above named springs contain very small quantities of borate and phosphate of soda.

TABLE II.

In 1000 c. c. of the		
Stahlbrunnen . . .	are found of <i>free</i> <i>carbonic-</i> <i>acid-</i> <i>gas.</i>	1507,0 c. c.
Weinbrunnen . . .		1425,0 c. c.
Paulinenbrunnen .		1250,0 c. c.
Rosenbrunnen . .		1203,1 c. c.
Neubrunnen		1429,6 c. c.
Ehebrunnen		1208,1 c. c.
Adelheidquelle . .		1081,5 c. c.
Lindenbrunnen . .		1000,0 c. c.

CHAPTER II.

TOPOGRAPHY.

THE village of Schwalbach situated in the valley of the Aar, a small stream, which breaks through the northwestern part of the Taunus is 314 mètres above the level of the sea. On account of this high situation the village is favored with a vigorous mountain air, by the surrounding hills it is protected from the influence of violent storms. The whole valley as well as the hills are covered with beautiful woods of all kinds of trees, and everywhere through these refreshing forests many and pretty walks are found leading gradually to higher points, where one will be rewarded with charming views of the Rhine and the Rhenish landscape.

The climate during the summer-time is never relaxing: in the months of August and September it is the most equable.

A most valuable quality of the climate is, that even when the day is hot, the temperature is always lowered after sunset to a most refreshing degree. Therefore we enjoy throughout the whole summer cool nights which allow even nervous persons, whose sleep had been troubled elsewhere by the continual heat, to secure here the long missed relief of an undisturbed and restoring slumber.



CHAPTER III.

INDICATIONS FOR THE USE OF THE SPRINGS.

HAVING discussed the quality of the remedies offered by the springs of Schwalbach I now may be allowed to trace the outlines of those diseases which are either cured or bettered or at least relieved by their use.

We remark generally: We do not suppose that we are able to introduce into a diseased body a measurable quantity of iron, be it by the application of the Schwalbach or any other iron-water; what we profess to accomplish, is neither more nor less than to enable a body that has become incapable of extracting the matters necessary for its existence from food, to acquire this function again. But there is another agent besides the spa, to which we must apply for help in reaching this end: this is the sojourn in the beautiful and refreshing mountain air and a life free from the tiresome occupations and troubles of business and toil.

Leaving alone hereditary deficiency of blood, we may observe that nearly all diseases, acute as well as chronic, affect the body in the above mentioned way, injuring its regular functions of metamorphosis, some

for a shorter, others for a longer space of time; wherefrom a state of the body results, which we call anemic, because its symptoms, viz. paleness of the skin and of the visible mucous membranes, lessened energy and reduced action of the nerves, hyperaesthesia, atony of the stomach and bowels, frequent loss of blood caused by great fragility of the vascular walls and finally the abnormal color of the secretions, can all be derived from the bad quality of blood.

This state of the system is, as we shall see, a widely diffused one, and by its changing forms, complicating other diseases or caused by them, and causing degeneration of the most important organs, it forms the chief-indication for the use of our springs.

A. THE ATROPHIC STATE OF CHILDREN, ITS CAUSES AND CONSEQUENCES.

OFTEN and often the question has been asked, why so great a number of children especially of large cities and overpeopled manufacturing-districts are atrophic? —When we see how the inhabitants of these places live together in narrow houses, where four or five floors are built one above the other, how they prefer to waste their earnings in the purchase of alcohol instead of expending them for good homely fare, how they are in need of regular exercise in the fresh open air and how they neglect the very first rules of cleanliness; it is but natural that children born from such parents should show even from the very first days of existence all the signs of deficient organisation of blood

and want of strength. Seeing further how these children are brought up by their neglectful mothers or (ten and more together) by badly paid baby-farmers cannot one imagine why they die early from weakness? But it is not only in the lower classes that weak and infirm children are astonishingly frequent; for a large contingent of the young wives of the higher classes having every sign of chlorosis and being already in expectation of bearing a child, omit the most necessary exercise in the open air, dance in hot and crowded rooms, wear unnaturally fitting dresses and also in consequence of a mischievous superstition neglect a proper care of their skin by bathing, which in their condition is rendered doubly necessary. It is no wonder indeed that an anemic and sickly race fills the parks and schools of our large cities.

This hereditary anemia is dangerous in itself, very often causing early death by phthisis and dropsy, but it is still more pernicious, because it forms the basis of the two most extended evils of childhood: *rhachitis* and *scrophula*, and what is the worst of all, of *tuberculosis*, that mortal enemy of all ages.

a) *Rhachitis* is thought to be a retardation of regular ossification and, as Prof. BARDELEBEN teaches us, it is caused by an increased secretion of lime-salts by the urine or by a diminished assimilation of these salts from the food, but I think that both their increased secretion as well as their diminished assimilation can only take place in consequence of a bad state of the blood; children born with a strong constitution and brought up in a reasonable manner commonly are

not rhachitic; but atrophic and poorly nourished ones are so.

Though a generally strengthening regimen consisting of easily digestible food as milk, bouillon, small doses of good old sweet wine (Tokay), then the sojourn in good air and in dry and sunny places is necessary above all things, yet there will always be some cases especially where rhachitis springs from a visible anemic basis that need the use of iron. In these cases I, following my experience, can recommend as being well supported and of good effect a mixture of Weinbrunnen with milk half-and-half.

b) *Scrophula*, which is described by our best medical authorities (NIEMEYER etc.) as hereditary disposition to inflammative diseases of the skin, mucous membranes, joints, bones, organs of the senses and especially of the lymphatic glands, and which is always characterised by general anemia and slow circulation, has very often been cured by the use of our springs, not only when preceded by the use of the salt-baths of Nauheim, Kreuznach, Ischl or Rheme, but entirely without their aid, particularly that species of scrophula which we are accustomed to call the torpid one.

While here our stimulating baths work very vigorously by their effect upon the torpid condition of the vessels of the skin we cannot expect from them even the slightest success upon those hardened and swollen lymphatic glands, against which iron only helps in form of bistouries.

c) Beside these there is another disease, of which anemia, be it inherited or acquired by neglectful bread-

ing, is very often the cause; that is *tuberculosis*. But there is a difference between those individuals who inherited the disease itself from their parents and who can be cured (if they can be cured at all) only by taking them from their birth-places and placing them under quite different conditions of life, and on the other side a species of children whose constitution bears the full stamp of anemia and is remarkable as much by a striking paleness of the skin and the visible mucous membranes as by a most excited action of the heart. These children always showing a great aversion to strengthening diet are always very thin and suffer frequently from headache and an annoying predisposition to affections of the respiratory organs from cold. A physician must take care not to confound the last symptoms with those of chlorosis, for in the first place the chlorotic state is only observed in girls while the above mentioned predisposition to tuberculosis is quite equally frequent in both sexes; then the first appears very early, long before the period of puberty; finally the children who by their anemic state are disposed to become tuberculous differ from the chlorotic ones by a peculiar liveliness which sometimes extends even to excitement.

Yet there are cases to be noticed in which tuberculosis is observed to follow chlorosis.

The internal use of iron given in such small doses as they are offered by our spa is a proved remedy against this dangerous disposition. After a comparatively short use of it I have seen children growing stronger, their appetite requiring regular and frequent

supply of meals, and their strange liveliness and excitement being replaced by a quiet and contented mood which became the more equal and undisturbed, the more the children got rid of their annoying headaches.

Here the rarified air of our mountains must be acknowledged to help us not a little in accomplishing this good effect; this air must on the contrary be avoided by all means in those cases where real tuberculosis is distinctly to be found in the lungs, the scientific indagations of the present day making it undenieably sure (Waldenburg), that these patients can only be bettered by breathing air which is more compressed.

2) While of the last three diseases, which we have spoken of, anemia is the cause, of others it is the consequence, for instance of all the frequent infectuous diseases of children like scarlet-fever, measles and others and especially of diphteritis. Having lost a great amount of albumen from their blood during the high fever connected with these diseases, the children, who recover, regain their strength only very slowly. Iron being here the best remedy and on the other hand the stomach and bowels of the patients being in a miserably atonic state, I always took care to order very small doses of Weinbrunnen continued for a long time and also the use of the sparkling baths tempered by the juice of malt.

B. CHLOROSIS.

At the time, when children begin to enter the period of sexual development, a general change of their

whole body and nature is to be observed, in both boys and girls; but while boys are in the habit of going through this change without any harm there are several reasons, why girls are very often the subjects of the most imminent dangers. The formation and elimination of the ovula causing the consumption of a quantity of blood, which the body was not accustomed to loose before this period, imposes a task upon these weak creatures the more oppressive because it continues to return, before the constitution has been able to repair the last loss.

Now one would suppose that the whole proceeding being physiological could be of no bad consequence to the body; as indeed it would not, if girls were accustomed from their early youth to take daily exercise in the open air and to the frequent use of baths a. s. o., all which is entirely neglected; for instead of this they are induced by our false and unnatural customs to sit still and occupy themselves the greater part of the day at school and to spend the remainder of the day at home engaged with their music and useless needle-work.—As often as chlorosis is observed in individuals whose health cannot be supposed to be affected by the sickening influences of the above named domestic occupations f. i. in the female inhabitants of the country, who are allowed to enjoy an almost continual open-air-life, in these cases the want of regular meat—diet and dark and unsufficiently aired sleeping-rooms must be accused of annihilating the sanitary effect of regular exercise in the fresh air.

Young girls whose blood becomes so deteriorated

by the aforesaid regular monthly loss, in return for which the body is not able to get a necessary supply from the food, usually show a peculiar want of alacrity in their movements, a great predisposition for taking cold, an excessive irritability of temper and a very painful sensibility of the stomach, and all these bad symptoms, increasing by time if not helped by art, form the condition of a very frequent affection commonly called "*chlorosis of pubescence*."

The anatomical character of this disease, which VOGEL denominates "*oligocythemia*", is a diminution of the cellular elements of the blood, as it is found in simple anemia; but which differs from simple anemia by an augmentation of fibrin, which on the contrary is diminished in the latter.

NIEMEYER found in some cases the quantity of the red blood-globules reduced from 130 to 40 parts; and we will soon prove that this excessive decrease cannot but produce important alterations of the composition of the tissues and fluids forming the body. Physiology having proved, that the red blood-globules must be considered as absorbing all the oxygen brought to the blood by the lungs and bearing it to the tissues, —the quantity of oxygen brought into the economy of the body must be diminished by their decrease.

Now a certain amount of this gas being indispensable for the regular nutrition of the tissues many bad results spring from this want: at first it irritates the nervous centres regulating the respiration and increases the action of the lungs so that the quantity of blood driven through them at once annoys the patients very

much: afterwards the lungs not being able to furnish the necessary portion of oxygen to the body, we may observe other disturbances of its nutrition, which being as different as the suffering organs are, offer many and multifarious symptoms.

In the first instance the faulty composition of the blood injuring the central organs of the nervous system, the chlorotic patients always complain of being tired, given to dreaming and very irritable; their muscles being in a very weak state, they avoid as much as possible walking and exercising, so that their appetite decreases from the want of motion.

Whether it is likewise the deficiency of the nutrition of the central nervous organs which causes the cases of *chorea* and *epilepsia**), sometimes observed in the progress of chlorosis, is a question hardly to be answered. A great many cases where these diseases have taken their origin at the period of beginning pubescence and which have been treated by strengthening remedies, seem to verify this opinion.

Because during the course of chlorosis the whole nervous system is affected, some pathologists**) of the present time think it to be caused not by an altered composition of the blood but by a disease of the ganglionic system.—I cannot decide whether this idea be right or not; nor do I find their arguments sufficiently proven.

*) Compare case I. and II. at the end of this chapter.

**) Among others GAILLARD-THOMAS, compare his "Diseases of Women" p. 634.

It is only in consequence of the above explained alteration of the respiration that the chlorotic patients suffer from a *derangement of the action of the heart*: its movements, being almost always quickened on account of the irritability of the nervous system, are weak and wanting in energy, because its muscular elements are badly nourished;—finally even healthy persons feel themselves annoyed by an abnormal frequency of the hearts action, the more so do girls, whose general irritability often leads them to a state of fear and anxiety; wherefore these augmented palpitations of the heart form the first and principal complaint of all chlorotic patients.

Beside these one remarks some other abnormities in those organs, which are strictly connected with the circulation of the blood: so I sometimes found the thyroid gland in a state of partly momentary partly stationary swelling, a circumstance which induced me to compare it with the process observed in the spleen in almost all cases of ague and malaria. The “*morbus Basedowii*” could not be the cause of the swollen thyroid gland in all the cases which I observed, because there never was even the slightest sign of exophthalmia and on the other hand all the signs of chlorosis were evident. Gaillard-Thomas’s above mentioned hypothesis which tries to prove chlorosis to be caused by an alteration of the ganglionic system will perhaps be able to explain this variable symptom by the influence of the diseased nervous system upon the vascular-walls. I neither can reject this explanation nor am I able to give any other.

Another not sufficiently explained symptom I will only mention, namely the abnormal sounds in the heart, which also occur in anemia and likewise those which one may hear in the veins of the neck, the so-called "bruit de diable."

The functions of the alimentary canal suffer in many ways from the results of chlorosis: the fluids of the stomach and intestines are not prepared in sufficient strength or amount; so that both the appetite and the normal digestion is disturbed. This disturbance of digestion develops itself in different grades and can reach a very pernicious degree. Very easily *ulcus rotundum* complicates this sort of dyspepsia, so that the physician often has to treat this disease of the stomach for a long time, before he can fulfil the indications which call for iron and tonics.

The *genital system* is affected in a high degree by the results of chlorosis and in a different manner in different individuals:

The ripening and production of the ova, in which the female system consumes so much of its strength during a period of about thirty years causes even in healthy people a decided excitement of the whole body, since its diminution is always followed by a more or less excessive overfilling with blood of the pelvic organs and by a subsequent flux of blood. If now the body is not supplied with sufficient means for the production of the ovum, this takes place only very slowly or passes by entirely.

In the latter case it appears as though the system had at least made an attempt to carry out its proper

function. So it happens that girls have menstruated once normally, but that the menstruation has never returned again, because the body could not furnish means for the renewal of the function and as a symptom of this failure one may observe the above discussed signs of chlorosis. In other cases it happens that as long as the chlorosis lasts, menstruation never appears; we only find every fourth week that condition of congestion in the pelvis which is observed also during pregnancy and after the cessation of menstruation during the climatic period, represented by great pain in the lower part of the back and sacrum,—*molimina ad menstruationem*.

Belonging to the treatment of chlorosis which of course ought to be attacked in its primary causes, namely the diminution of the cellular constituents of the blood, all seem to agree that the system calls most urgently for the internal use of iron, which is commonly known as the suitable remedy to restore the cellular elements of the blood by assimilating the fitting matters contained in the food. About the right quantity of iron, and the form which may be the most suitable, a generally accepted rule could not be established as yet.

While others say that one ought to give only strong doses of concentrated preparations of iron and to avoid the use of iron-springs entirely, NIEMEYER teaches us, that the best way of curing chlorosis is, to order the use of the pharmaceutical iron-remedies for the time, when the symptoms are very urgent, and afterwards that of a mineral iron-water.

We only refer to FRERICH'S' deduction, which, opposed to the one just discussed, I have mentioned in my general remarks about the drinking-cure in Schwalbach.*) Experience proves the correctness of this deduction by a great number of cases observed by me in every season:

For there always are chlorotic people sent here by their family-physicians with the direction to drink as much as possible of the Stahlbrunnen, which contains the greatest amount of iron. These persons very often complained of a disordered digestion, which I very seldom observed in those who followed my prescriptions. So I often saw chlorotic girls cured by the use of only small doses of Weinbrunnen (which, as we saw before, contains only a small quantity of iron), who at home had been treated a long time with large doses of iron without the slightest success.

Yet we must confess that this good success must perhaps be attributed not to this preferable form of offering the iron alone, but also to the favorable effect of the altered conditions of life and the continual sojourn and increased exercise in the fresh mountain air, which proves agreeable after a short time even to the most irritable patients.

Finally, *though we must acknowledge the unchanging fact that the baths do not furnish directly the slightest amount of iron to the body through the skin, nevertheless the amount of carbonic-acid-gas, which the baths contain, by the powerful influence upon the*

*) Compare page 10.

capillary circulation of blood in the skin increases the low-graded metamorphosis.

I. C A S E.

C. D. aged eleven years, a dark-complexioned girl of dim, but not weak frame, lost her usual good appetite at the end of January 1873, and became irritated and lazy, and was annoyed by an almost continual though not very severe headache. At the same period the skin and visible mucous membranes appeared very pale. About four weeks afterwards involuntary movements of the left arm appeared, and some days later of the left hand, and convulsive contractions of the left corner of the mouth.—Finally, all the symptoms of *chorea* were observed. These symptoms together with great weariness and the excited action of the heart, the quickened respiration and finally the existence of accidental sounds in the heart induced the attendant physician to declare that the girl was suffering from grave *chlorosis*. Wherefore he ordered to take iron internally and malt-baths, a treatment which was followed during the months of February, March and April. At the beginning of the month of May, all the signs of chlorosis and chorea still persisting, the patient was brought to Schwalbach, where I ordered her small doses of Weinbrunnen (four to ten ounces a day), which were well supported. Also baths were taken at three days intervals, which lasted only ten minutes.—About the middle of June the signs of chorea became less apparent. On the 20th of July, after a short headache, the first menstruation occurred

quite regularly and lasted for four days. On the third day the chorea entirely ceased.

The young lady has since this time enjoyed vigorous and undisturbed health. I saw her last in the year 1872, when she came back to Schwalbach for a short sojourn, in order to prevent a returning attack of chlorosis.

II. C A S E.

In the beginning of the month of July 1873 I was called to a young american lady, fourteen years old, who having travelled in great heat during the whole day, had in the evening suddenly been attacked by violent epileptic cramps. Her mother told me that the girl, hitherto enjoying a healthy constitution, had for the last ten months been subjected to frequent but not always equally violent epileptic convulsions; on the whole she had become evidently lazy and slow and low-spirited during this time. She had not menstruated as yet and offered all the symptoms of chlorosis.

I ordered her to take a bath every fifth day and doses at first of Weinbrunnen, afterwards of Stahlbrunnen, increasing by degrees.

During five weeks no other attack of convulsions took place; but then great weariness and frequent headache annoying the patient, I was prevented from the further application of the above mentioned remedies. Supposing that the soothing baths of Schlangenbad would be here of good effect, I sent the patient there. And after she had been there only one week,

and taken no more than two baths, I was informed that the regular menstruation had suddenly occurred without the slightest trouble. The girl's grateful mother sent me frequent news of her daughter, who since has regularly menstruated and enjoys the best health.

C. ANEMIC STATE CONNECTED WITH OR SPRINGING FROM ACUTE AND CHRONIC DISEASES.

a) Of all the acute diseases the infectious ones are the most frequently followed by anemia: And of these especially *ileotyphus* and *cholera*. People who in consequence of a typhus suffer from an injured nutrition and great weakness of muscles and are deprived of the means of quick convalescence by a predominant atonic state of the alimentary canal often come to Schwalbach and make a successful use of our springs regaining their regular digestion and accustomed energy of both body and spirits.

b) Among those chronic diseases, which are wont to destroy completely a man's strength, because they alter the composition of blood very quickly, is to be mentioned:

1. DIABETES MELLITUS.

The careful use of iron-water should be recommended not against the primary cause of this grave anomaly of the constitution, but rather against the consequence resulting from that poor state of the blood, which is produced by the enormous consumption of albumen, thrown out of the body in form of its final

oxidation, namely of sugar. Sometimes, especially at that period of the disease, when after the use of Carlsbad the secretion of sugar had ceased or at least lessened, I observed so great an improvement of the blood by the internal use of our spa, that an already suspected tuberculosis, so often dangerous in the course of mellituria was thought to have been prevented.

2. MALIGNANT TUMORS,

even in the first periods of their existence, may sometimes before the patients complain of any characteristic subjective symptoms, produce a high degree of anemia: Which not seldom overtakes the system so suddenly that one cannot even suppose the tumor to be caused by a formerly existing cachexia.—I am not so presumptuous to profess that by any remedy a cancer might be prevented from extending, but it cannot be denied that it is possible to improve the composition of the blood in the very first beginning of its existence, so that the last dreadful consequence may be delayed for years.

More beneficial will be the action of our spa, when used by patients, who had just been freed from a malignant tumor by an operation. We presume that this may be the only way to prevent relapses otherwise so deplorably frequent.

3. Of other diseases which may be accused of causing anemia or a cachectic state of the system, I only mention those of the *nervous centres*, particularly of the *brain*, next the *degeneration of the liver, spleen*

and *lymphatic glands*, the *infection by poisonous metals*, and finally *constitutional syphilis*.

4. THE AGENTS SUPPOSED TO PROVOKE AGUE AND MALARIA

must equally be accused of causing sometimes a state of a very great anemia:

a) That during the attacks even of the slightest cases of ague the system consumes an uncommonly high amount of matters, is evident by the signs of weakness and infirmity, which continually increases with almost every additional attack. This immediate loss of strength will be the worse, the more intense the infection has been, and the longer a person has been exposed to it.—In the course of malaria, there is disenteria, there are profuse hemorrhages of the nose and vomiting of blood, hematuria and albuminuria, which all concur in diminishing the physical powers in the shortest space of time.

b) But these are not the only bad consequences of malaria: The disturbance of those organs, the function of which is to accomplish the restitution of lost matters, namely of the alimentary canal and its dependant organs seem to be still more grievous. The secretion of the juices of the stomach and bowels is destroyed, the swelling of the liver and the catarrhus loosening of the mucous membranes of the biliary ducts prevent the secretion and discharge of the bile, therefore the assimilation of the food is reduced to the minimum.

The spleen being the most affected, the formation

of blood-globules, which function VIRCHOW*) attributes to the spleen, is disproportionably deranged, even in slightest cases of intermittent fever.

VIRCHOW and VOGEL**) first showed that in the blood of those, whose spleens are enlarged in consequence of ague and malaria, there is a continual decrease of blood-globules and an increase in the watery elements of the blood. For a great number of patients, whose spleens are more hypertrophic than their livers, especially those, who have suffered from profuse and frequent loss of blood, the internal use of iron-springs and a sojourn in fresh mountain air are the only remedies:—Iron brought into the blood improves its deficient composition and assists here as well as in chlorosis the digestion and assimilation of the food, and returning to the blood its normal quantity of well-nourished red blood-globules, it removes the causes of the cachexia.

But those cases where the digestion is too much disturbed, and where the function of the liver is too slow, in consequence of its fatty degeneration, urgently call for the use of Kissingen, Marienbad, Karlsbad etc., and only after their improvement there, they will profit at our spa.

I. C A S E.

Mr. H. of New-York, thirty-three years of age, of a healthy and strong constitution, left New-York in

*) Cellularpathol. Chapter VIII. p. 163.

**) VIRCHOW, manual of spec. pathol. and therap. vol. I.

the autumn of the year 1871 for the country near one of the lakes in the United States, where malaria is a common cause of very severe illness. He had not lived there quite ten weeks, when he was attacked by an intense malaria-fever. In all the numerous paroxysms he suffered from hemorrhage of the nose, hematemesis and bloody stools. After his return to New-York the most violent symptoms were removed by quinine, but in January of 1872 the patient still feeling very feeble and poorly was attacked by an intermittent neuralgia of the fifth nerve of the right side, returning every fourth day, which was cured only by a long use of FOWLER'S solution. Coming here in the month of June 1872 he presented all the signs of the profoundest prostration: the digestion was slow; his bowels constipated and the action of his muscles so weak, that he was compelled to depend upon assistance of a strong man when he desired to walk the shortest distance. The size of the spleen was more increased than that of the liver. Albumen was not found in the urine. During the first fortnight the patient was ordered to take very small quantities of Weinbrunnen and cold bathings of the chest and abdomen, repeated several times a day. The latter were very successful in restoring the lost activity of the skin. His digestion apparently improved, his appetite increased so well, that I scarcely could retain the patient from excesses.

By degrees all the symptoms of disease disappeared. —From the fourth week I could order Mr. H. to take Stahlbrunnen, and he left Schwalbach after a sojourn

of six weeks perfectly fresh and healthy.—I saw him again the next spring when he gratefully told me, that his cure had been complete.

II. C A S E.

Miss K. from Holland, came to Schwalbach after having been at Kissingen. For the last three years, she had suffered, especially during the autumn-months, from irregular and intermittent paroxysms of cephalalgia, and a continued disturbance of digestion. This had induced the attendant physician to make an examination of the organs of the abdomen when he found fatty infiltration of the liver and an enlargement of the spleen. By the use of the Racoczy in Kissingen, digestion and defecation became regular, although the latter remained a little slower than normal. While the intumescence of the liver diminished, that of the spleen persisted still.

This patient took here Weinbrunnen with good success and having changed her residence to Coburg in the same autumn, she continued to enjoy undisturbed health.

The good effects of our spa against the deficient composition of the blood resulting from malaria-infection seems to call for the same treatment against *leukemia*, which is so difficult to treat. The most predominant symptom of leukemia is an extraordinary decrease in the number of red blood-globules, the white ones being multiplied in such a degree, that the proportion of the white to the red ones is: as two to

three, while the normal proportion is as one to three hundred.

VIRCHOW and VOGEL discovered the nature of this phenomenon, the latter demonstrating the possibility of discerning the disease in living persons, while the former showed that the spleen and the lymphatic glands were affected before all other organs.*) He established a difference between a splenic and a lymphatic form of leukemia. Afterwards VOGEL**) deemed it important that an abnormal increase of the spleen was the most frequent complication of this disease. He found it sixteen times in nineteen cases.

Hitherto all the therapeutical experiments against leukemia proved unsuccessful; perhaps it is possible by the use of iron to enable the proper organs to accomplish their normal function, namely to form red globules out of the white ones and to remove the pernicious alteration of the spleen.

5. ANEMIA CAUSED BY LOSS OF BLOOD IN CONSEQUENCE OF SUDDEN ACCIDENTS.

If a healthy body is deprived of a great quantity of blood, experience proves that the whole system strives to replace the loss by water entering into the vessels from the tissues. This proceeding cannot but alter in a high degree the entire composition of the blood, because the replacing fluids do not bring any supply to compensate the lost cellular elements. As

*) VIRCHOW's Archiv vol. I. p. 563.

**) VIRCHOW's manual of spec. pathol. and therap. vol. I.

often as the loss has not been too excessive and another loss does not follow the first too soon, healthy persons will recover from it in a proportionally short time. But in cases, where before such a loss an individual had been suffering from infirmity or any kind of disturbances of nutrition, such as dyspepsia, there we may observe not rarely after a single loss of blood a chronic sickness, which bears every sign of the often mentioned anemia.

6. But much more frequently than from a sudden loss of blood, cases of anemia result from A CONTINUED LOSS OF THE FLUID AND SOLID CONSTITUENTS of the body. This therefore is observed after chronic diarrhoea, protracted suppuration and blenorrhoea; also after profuse and enervating secretions of mucus from the bowels in hemorrhoids; finally, after excessive and continued loss of semen by pollutions and venereal excesses.

The deterioration of the blood which results from these diseases sometimes lasts for years and it is either very difficult to treat or if treated its primary cause must be attended to.

Notwithstanding there are cases when individuals are worn out to such a degree that they cannot be considered strong enough to endure a treatment which is directed against the cause. Here the moderate use of the iron-waters of Schwalbach and of the baths tempered by the juice of malt often has proved a good preparative treatment particularly for those who have been exhausted by hemorrhoidal blood-fluxes. Finally, we have often seen a remarkably good success follow the cautious use of Stahlbrunnen

when given for chronic diarrhoea of some years standing.

I. C A S E.

Mr. D., 32 years of age, a tall and strong officer was wounded at the battle of Le Bourget (1870) by splinters, which lacerated the glutæus maximus of the left side. He lost a large amount of blood before reaching the nearest field-surgeon. This loss of blood together with a subsequent suppuration, lasting four months and caused by the large and profound wound, was followed by a prostration so dangerous and complete that his condition called instantly for a tonic treatment before the wound was healed.—Stomach and bowels of the patient did not act at all. Quinine and iron given in pharmaceutical doses, could not be supported by the patient, and he then was ordered, though still lying in bed, to take small quantities of Weinbrunnen three times a day and as much as possible of old Tokay-wine. The first result of this treatment was, that after three weeks he could be brought to Schwalbach, where a sojourn of two months was sufficient to restore him so completely that he could join his regiment.

II. C A S E.

Mr. B., a teacher, twenty-four years of age, had suffered for a year, as a result of a fit of indigestion, incurred three years previously by excess, from a continually recurring and very painful diarrhoea which sometimes increased to tenesmus and always ended

with the secretion of only a small quantity of thin mucus. Nevertheless, he was compelled to work and study very hard night and day through the last two years when gradually his nervous system became intensely excited. This irritation was characterised by great muscular weakness and rheumatic pains and a frequent and very annoying formication upon his arms and legs. It is not surprising that, at last, the man was in a very poor state of both body and spirits. When he came here, his diet was carefully regulated and the use of the spa restrained to four ounces of warmed Stahlbrunnen twice a day and a cold bath (of 72 down to 63° F.) every third day, and daily wet frictions of the back were ordered. All this being well supported, the digestion improving from day to day he not only regained his strength but became more cheerful in a very short time. I sent him from here to the sea-side, and saw him when he returned thence completely restored to health.

7. The class of chronic diseases from which anemia results as a frequent consequence can be finished by those of the chest, especially by chronic exsudative pleuresia. We observe patients of every age and sex, who having been affected by an exsudative inflammation of the pleura costalis or pulmonalis cannot get rid of the exsudation for a long time, and whose health is injured in different degrees either by difficult respiration or irregularity of the action of the heart, so that at last the state of the whole system may be dangerously affected. Whenever such people are sub-

jected to a treatment in Schwalbach at a time when their disease has already caused great anemia. I strive to keep these patients out of draught. The treatment itself consisted in frequent cold bathings of the whole body followed by dry envelopping in woolen coats. The water of the Weinbrunnen together with this hydrotherapeutical treatment sometimes causes a diminution in the amount of the exsudation and strengthens the whole system.

I remember the case of a boy, twelve years of age, who has suffered since eighteen months from a pleuritic exsudation of the left side, and whom after a sojourn of six weeks I could send home from here free from all difficulties of respiration and in full strength.

A similar success was reached in another case of hydrothorax which was found in a child after the measles, though inflammatory pleuresia had not existed at all.

D. THE CHRONIC DISEASES OF WOMEN.

The following series of diseases affecting the same sex and taking their origin from the same issue seem to call for common discussion. But before entering upon this, I must remark, that I do not intend to give either a detailed description or even an enumeration of all the accidents and diseases which can attack the female system in the long space of nearly thirty years, during which it serves to the natural end of propagation: These disturbances interest us here only in so far, as they can be benefitted by the use of our springs. The more carefully and exactly scientific

investigation discerns the causes and characteristic symptoms of the diseases of women and the more it strives to cure the diseases by removing their causes rather than their symptoms, the more limited is the number of those maladies which call for the application of iron.

It is not long since physicians, ignorant that conception might be prevented by several mechanical obstacles such as narrowness of the cervix uteri or a faulty position of the portio vaginalis, and on the other side by some very different and abnormal conditions of the womb, used to send all their sterile patients to the iron-springs. Among these were of course always some, whose sterility had been caused by anemia, and who therefore were cured by the use of baths and injections into the vagina and by the strengthening of the whole system.

But now such words as sterility, blenorrhoea, amenorrhoea, &c., which only mark symptoms are no longer used by gynaecologists as terms of diseases, and therefore one does not send as one did before all the leukorrhoeic, amenorrhoeic, &c., to Schwalbach, without having discovered the real affection, from which they suffer.

As such diseases of women, which may be cured at Schwalbach, I can name the following:

- 1) *Anomalous menstruation caused by general anemia.*
- 2) *Chronic catarrh of the mucous membrane of the sexual organs.*

- 3) *Atonic state of the womb caused by its incomplete involution after child-birth and abortions and their subsequent bad results.*
- 4) *Diseases caused by alterations of the position of the womb or by grave degenerations of its walls.*
- 5) *Alteration of health arising from child-birth and miscarriages following each other in very short intervals.*

I. THE ANOMALOUS MENSTRUATION CAUSED BY CONSTITUTIONAL ANEMIA.

In a former chapter discussing chlorosis, the disturbances of the monthly blood-fluxes are mentioned as far as they are produced by the chlorosis of pubescence. But naturally all the anomalies of the monthly function, which spring from anemia offering very similar symptoms, I think it proper to discuss them here altogether. Those anomalies, on the contrary, which take their origin from alterations of the structure of the uterus and its dependent organs, must be excluded from this discussion, since they are symptoms of these diseases.

The condition, into which the system is brought by anemia and which I tried to define in a former part of this essay, make it evident, why such a task, as is demanded by the periodical consumption of matter, cannot be accomplished perfectly nor in the normal intervals, if it can be accomplished at all.

The menstruation of anemic patients is therefore

either deficient or irregular in time or it is missed altogether.

Deficient menstruation is characterised by a pale color and a lessened quantity of the menstrual blood and it is mostly irregular, namely it does not occur every four weeks, nor does it last one time as long as the other, and generally it is rather rare than frequent. In other cases the enormous loss of matter thinning the blood as well as the fragility of the ill-nourished vascular-walls is a cause of menorrhagia, this is of an abundant secretion of blood lasting unusually long.

Like all the other alterations of menstruation the anemic one is pretty constantly accompanied by neuralgic pains. These commonly appear one or two days before the menses occur and either cease with their appearance or last through the whole period.

CHARLES WEST*) described these pains in the following way:

“The pain, in such cases, precedes menstruation for a day or two, generally reaches its greatest intensity in the course of the first thirty-six hours of the catamenial flow, being sometimes so intense, that the patient writhes on the floor in agony, and then by degrees subsides, though it does not cease entirely till the period is over. Though severest in the uterine and pelvic regions, the pain is not in general limited to those situations, but is experienced also in

*) CH. WEST, Lectures on the diseases of women, p. 63.

the back and loins, is referred to either groin, or rather to each ovarian region and shoots down to the inside of the thighs. The pain, too, is aggravated at intervals and becomes paroxysmal, like that of colic or of labour, while the whole abdominal surface is so tender as scarcely to bear the slightest touch. In addition to these pains, all radiating more or less obviously from the sexual organs, there is often much suffering in other parts. Intense headache is frequent, often confined to one side of the head, or presenting the well-known characters of *clavus hystericus*; or, in other cases, the stomach is disordered, and the patient distressed by constant nausea or frequent vomiting. In many instances various other hysterical symptoms manifest themselves, often, indeed, with peculiar intensity, and I knew a patient in whom an attack of hysterical mania ushered in on more than one occasion a menstrual period. This neuralgic dysmenorrhoea, however, is by no means invariably associated with a hysterical temperament, and patients who suffer most intensely during menstruation sometimes manifest no symptom of hysteria, but on the contrary, are remarkable for quiet self-possession and well-regulated minds.

In some instances, it seems as if the disorder of the nerves extended to the whole system, while in others it is limited to those which supply the sexual organs and is then usually of shorter duration on each occasion, though not

by any means of necessity slighter in the suffering which attends it than when the sympathies which it awakens are more extensive.”

Those circumstances which produce an anemic condition are: the frequently mentioned chlorosis and beside this some conditions, connected with the sexual life of women, for inst. pregnancy, during which the blood is always deprived of a part of its cellular constituents, is sometimes accompanied by so grave a degeneration of the blood that afterwards not only the lactation of the child is impossible but also the production of ova and menstruation is interrupted for a long time. The same effect has often been observed when persons of a weak constitution protract lactation for too long a time. Tonics like the waters of Schwalbach can here be recommended from proved experience as very effectual; they invigorate the system and render it able to accomplish its regular functions.

2. CHRONIC CATARRH OF THE MUCOUS MEMBRANE OF THE SEXUAL ORGANS.

Chronic inflammation of the genital organ of women in connexion with the subsequent augmentation or degeneration of the natural secretion takes its origin from three different parts of the organ, and therefore must be divided in three different forms; and these are:

a) *Chronic inflammation of the mucous membrane of the vagina*

consists in swelling and inflammation of the few mucous glands of the vagina, which produce a thin secretion,

appearing yellowy-white by the abundant quantity of exfoliated epithelium. The numerous papilla by degree grow hypertrophic and in long enduring catarrhs render the surface of the mucous membrane granulated. The blenorrhoeic secretion of the vagina is a putrid mucus and sometimes very profuse. Its reaction is acid like that of the normal one and sometimes to such a degree that it is even acidifies the originally alkaline reaction of the catarrhal secretion of the fundus and cervix. This is the reason, why all the secretions of the genital organs passing the vagina, are acid.

The microscope shows that bruised epithelium, cells of pus and an infusorium (*trichomonas vaginalis*) form the constituents of the secretion.

The chronic catarrh of the vagina may exist as a consequence of an incompletely cured acute one, or it may be caused by gonorrhoea or such inflammations, which are produced by mechanical irritations. Beside these chlorosis, anemia after dangerous child-births, abortions, loss of blood, plethora of the abdominal organs (observed in cases of abdominal and ovarian tumors, diseases of the liver, hemorrhoids), may be accused of causing vaginitis chronica. But its most frequent causes are the diseases of the fundus and cervix uteri, on account of their infectuous secretions passing the vagina.

I only mention here that the idiopathic vaginitis not being nearly as frequent as the complicated form, its treatment must be directed against those diseases of which it is the consequence. The local treatment consists in carefully cleaning off the surface of the

vagina and in applying a solution of glycero-tannin. In cases of vaginitis caused by chlorosis or anemia, I found that injections of warmed Stahlbrunnen-water and cool sitz-baths proved to be very successful in invigorating the tissues and rehabilitating their lost tone.

b) *Chronic endometritis of the cervix uteri.*

The following are its characteristic symptoms: The mucous membrane is loose and swollen and the size of the cervix is increased by swelling; the secretion is thickened and glairy, the epithelium falls off abundantly and the ulcerated surface of the membrane is covered with hypertrophic glands and papilla. (DR. HILDEBRANDT.*).

Whenever this disease is found in virgins, it may be most dangerous for the whole system, the naturally narrow canal of the cervix is rendered impassable for the menstrual blood and the other secretions of the fundus uteri by the swelling of the mucous membrane. Very often it causes unnatural positions of the womb.

In women, who have had children, chronic catarrh of the cervix is not quite so dangerous, the canal being widened; but for these the fact that the cervix is often violently pulled and squeezed during the passage of the child, sometimes causes grievous erosions and ulcerations, which are followed by frequent hemorrhages and also by very annoying derangements of menstruation and various alterations of the nervous system,

*) VOLKMANN'S collection of clin. lectures No. 32, p. 6.

such as nausea, cardialgia, cephalalgia, pains in the back, &c.

Chronic catarrh of the cervix always requires local treatment and only those cases, which are complicated by intercurrent hemorrhages may call for a generally tonic treatment in order to prevent sudden prostration.

c) *Chronic endometritis of the corpus uteri.*

The anatomical characteristics are in the first period swelling and inflammation of the numerous glandulae utriculares imbedded in the mucous membrane. Afterwards the latter is thickened and deprived of the ciliated epithelium; at last the whole cylindrical epithelium having disappeared, the endometrium is no longer like a mucous membrane at all and adopts the character of a serous one. Underneath it, one finds bloody suffusions, which must be considered as the remains of bruised atheromatous arteries.

At the same period the size of the womb is pretty constantly increased by hypertrophia of its walls, the chronic catarrh taking its origin very often from a deficient involution of the womb after child-birth and abortions. At the beginning the secretion is very scanty and viscid and rusty-colored, at the time shortly before and after menstruation it becomes thin and abundant, if the catarrh has lasted for some time. Its reaction is alkaline.

Local disorders consist in a feeling of heaviness and fullness of the lower part of the abdomen, which increases gradually to the same degree as if large massy tumors existed in the inner or outer part of

the uterus. The patients usually say that they feel as though something were breaking 'out of their womb. This very disagreeable symptom is most violently felt a week before and for a time immediately after the menstruation.—The discharge of the secretion is increased by the pressure of the abdominal muscles during micturition and defecation.

Chronic catarrh of the fundus is developed most frequently in consequence of acute endometritis after the puerperal state and abortions and is joined to chronic metritis and subinvolution of the uterus and it also arises from catarrh of the cervix, whenever this prevents the complete discharge of the menstrual-blood by the swelling of the mucosa. Likewise it is caused when the uterus is injured by probes. Sudden suppression of the menses by taking cold or fright &c., is also a frequent etiological cause. Finally it complicates tumors of the uterine walls and of the abdomen and that anemic state which follows a too long protracted lactation.

As regards the treatment of the fundus-catarrh, I will only say that before everything it must be directed against the causes. Whenever by lactation or in consequence of protracted and abundant blenorhoea the system is deprived of the means of regaining the lost strength, or when the catarrh is the direct consequence of puerperal subinvolution, both the internal use of iron and (if not prevented by an abnormal local irritability) the injections of the mineral iron-water into the vagina are most effectual. This treatment, especially the internal one, is sometimes required by the

urgency of the anemic symptoms even before the chief-indications can be accomplished.

GENERAL REMARKS CONCERNING CHRONIC CATARRH OF THE SEXUAL ORGANS.

The three forms of catarrh of the genital organs have been discussed separately, because they require different treatment. Nevertheless, I cannot omit to add that they complicate each other very often and that some important symptoms are common to them all. I refer in this connection to a sentence of GAILLARD-THOMAS*), referring to the catarrh of the cervix as well as to the other forms of genital catarrh:

“Usually before the disease has existed a long period, the constitution of the patient will show signs of becoming implicated. She will become nervous, irascible, moody and often hysterical. Her appetite will diminish and digestion grow feeble so that impoverished blood will soon be observed as a result of impaired nutrition. With some or all of these signs of the existing disorder the patient may continue for a length of time without suffering from others of more annoying or grave character. Complications may, however, rapidly develop themselves; cystitis, cervical hyperplasia and vaginitis coming on and proving exceedingly troublesome Sometimes nausea and even vomiting present them-

*) GAILLARD-THOMAS, manual on the diseases of women, p. 241.

selves as symptoms, and these together with the digestive disorder before mentioned, produce a deterioration in the nutrition of the patient."

To this sentence, I may be allowed to add my own opinion: The whole system is continually injured by the protracted loss of albumen contained in the catarrhal mucus and this loss is not compensated by a sufficient amount of assimilated food, because chronic inflammation of the sexual organs irritates the nerves and produces cardialgia and nausea; sometimes even complete anorexia. The digestion therefore is soon disturbed in the highest degree. Beside this, in most cases either idiopathic constipation is observed, or it is developed if the patients too often delay defecation, because it is painful and joined to disagreeable discharge of the catarrhal secretion. No wonder that from insufficient supply and continual loss results a subsequent cachexia.

Finally, the uninterrupted local irritation of the nerves of the sexual organs produces a series of nervous symptoms, complicating chronic catarrhs and other diseases of women; we are wont to call this series of symptoms: "Hysteria."

This complication must be considered as a great irritation of the whole nervous system, which results from the reflex-action of the genital nerves and appears in attacks of a most variable nature. We distinguish three different forms of it:

α) Hysteric symptoms arising from irritation of the sympathetic nerve.

Almost all hysteric patients suffer from irregular palpitation of the heart, the slightest trouble acting upon the heart by quickening or retarding its movements. And though not the slightest anatomical anomaly of the organ can be found, all the imaginable varieties of pulse have been observed in them.—Very frequently there is a sort of uneasiness in urinating, which may increase to real difficulties of micturition.—The digestion is disturbed in many different ways, f. i. the patients complain of frequent eructations (nothing but common air rising from the stomach), flatulence, which sometimes even may be taken for meteorism; of bulimia and also of anorexia, of perversity of the taste (f. i. some patients are inclined to eat the strangest things such as chalk or slate-pencils &c.), of cardialgia and nausea.

Sometimes a part of these symptoms, combined together, form an attack, the nature of which even a physician is not always able to discern immediately. But after some hours the whole picture will be changed and it will be evident, that nothing but hysteria has been the cause of the alarm.

β) Symptoms of irritation of the medulla spinalis.

All the nerves that issue from the spinal marrow are in continual excitement, which may produce pains like those of parturition in the womb and like rheumatism in the back. Very often a feeling has been

described, as though the backbone were bent and violently compressed. Sometimes a pressure against different points along the back is peculiarly painful; yet real neuralgias of the spinal nerves are seldom observed.

The sensory nerves are generally more affected than the motory ones, though partial paralyses have been observed. Nearly all the patients complain of hyperaesthesia; not quite so many of anaesthesia in different degrees, local as well as general.

γ) Cerebral symptoms.

The most unbearable and at the same time the most frequent are those disturbances that arise from affections of the cerebral nerves; namely: Neuralgias of the nervus supraorbitalis, infraorbitalis and mentalis. Some patients complain of subjective perceptions of the olfactory organs or of hallucinations of the sight and hearing. The memory is lessened in nearly all cases of hysteria.

Another phenomenon has been described by DR. ROMBERG*) in his classical discussion on the psychical disturbances in hysteria; namely, the entirely deficient activity of the will. He says: "From the failing energy of the will springs the impossibility of resisting to bodily and psychical impressions, which therefore wear out the patients in a degree never to be observed in other chronic diseases. They never are able to con-

*) ROMBERG, manual on the diseases of nerves. Vol. I., Divis. II., p. 456.

ceal their state, nor do they intend to do so." The same author has the opinion, that a great number of cases of hysteria is founded upon anemia and he expressively prefers the use of iron-water to that of pharmaceutical iron-remedies.

3. ATONIC STATE OF THE WOMB CAUSED BY ITS INCOMPLETE INVOLUTION AFTER CHILD-BIRTH AND MISCARRIAGES AND THEIR SUBSEQUENT BAD RESULTS.

It has been mentioned that the great increase of the womb during pregnancy is joined with hypertrophia of its walls, effected by the increase of all its elements, especially of the muscles. Those of them which had been freshly formed during the first four months of the pregnancy are partly destroyed by retrogressive metamorphosis, namely by fatty infiltration and degeneration, before the child is born, but their greater part is removed only after the confinement by that process of metamorphosis, which is called involutio uteri puerperalis; and by which the womb is reduced to nearly its former state.

At the same time the mucous membrane of the uterus, the endometrium is recently formed. Many and different are the conditions which interrupt this involution: I mention only general dyscrasia existing before the pregnancy (tuberculosis or scrophula), enfeebling dispepsia, acute diseases during pregnancy, abundant loss of blood before and during parturition and in the puerperal state, violent and protracted pains, f. i. where local impediments prevented the

delivering, and finally, all the causes of abortion and abortion itself.

In cases of deficient involution the womb remains enlarged, its walls thickened and turgid and succulent. The endometrium being more like a freely bleeding membrane covered with papilla, than like a mucous membrane, is nearly always inflamed. The incomplete involution especially affects the corpus uteri. So CHARLES WEST*) says in his already quoted "Diseases of Women":

"In these cases, it is the body of the womb, which is the part most affected, since it bears the greatest part in all the changes that pregnancy brings with it, so any defect in the involution of the organ will leave its body more enlarged, the lining of its cavity more vascular, than are the walls or the lining of the cervical canal. Often, indeed, but by no means always, enlargement of the neck of the womb accompanies enlargement of its body, but the former is not the occasion of the latter,—is, I believe, secondary in the order of time, and subordinate in point of importance."

The consequences of these states of sub-involution are various and sometimes very grave for the general health as well as for the several functions of the sexual organs. The numerous vessels of the uterus not being entirely compressed by the loosened uterine walls allow frequent loss of blood during the puerperal state; the

*) p. 126.

widened lymphatics easily absorbing infectuous elements favour the existence of metritis, peri—and parametritis.—Afterwards the heaviness of the enlarged and atonic organ must be accused of causing frequent abnormalities of position, namely ante- and retroflexions and versions and all their bad consequences. Of these latter I will only mention the mechanical retention of the menstrual blood, and of the leucorrhoeal secretion in that part of the uterus, which lies above the flexion, so that only very painful contractions can press out the contents and, finally, the impossibility of conception,—sterility. But even in those cases, where there is no flexion of the womb, the above mentioned deficiency of the regeneration of the endometrium produces a chronic catarrh and the uterine wall always remains atonic and inclined to painful and profuse menstruation and all those nervous symptoms, which I have described as hysteric.

If there are no other alterations of the position of the womb than ante- and retroversio, the application of the baths of Schwalbach sometimes joined to injections and also the internal use of the iron-water may be urgently recommended: which must on the contrary be completely avoided, when the uterus is in the state of subacute inflammation or recent flexion on account of its great congestion. Against the inclination of the pregnant uterus to expulse its content before the right term, a phenomenon often observed after abortion has once taken place, the treatment in Schwalbach has often been of a most favorable effect. The atonic state which usually remains after mis-

carriages must be supposed as quite sufficient to explain this effect; so that we are not compelled to look for so unsatisfactory an explanation as "the dynamic effect." I think that it is the strengthening of the whole system which has enabled such ladies, whose hopes have been destroyed more than once by miscarriages, to complete at the right time their pregnancies after this treatment.

I. C A S E.

ENDOMETRITIS CHRONICA CAUSED BY ATONIA UTERI EX SUBINVOLUTIONE.

Mrs. H., twenty-three years of age, of middle size and vigorous constitution looked pale and anemic and, being married for five years, had born two children normally, the last one after having past through a gravidity very disagreeable through intense dyspepsia. Having nursed the latter child for two months she was compelled to give up the lactation on account of her own great infirmity. From this time she menstruated every fourth week very profusely and painfully during four days.

The patient complained of a slight blenorhoea but of frequent and intense hemicrania, sleeplessness and great weakness. Dyspepsia and constipation annoyed her continually.—The examination of the womb showed a considerable retroversio uteri. The fundus uteri lying against the os sacrum, was much longer and thicker than normal and could be erected, when supported by the examining finger.

After the patient had taken fourteen baths of 86 degrees Fahr. and sitz-baths (each lasting twenty minutes) with injections of cool Stahlbrunnen-water and had drunk six ounces of Weinbrunnen twice a day, on the nineteenth day the treatment was interrupted by the occurrence of menstruation. This was still very profuse, but neither before its occurrence nor during the four days, it lasted, was it accompanied by the formerly nearly unbearable pains in the back and os sacrum. After this the patient resumed treatment and having taken sixteen other baths and changed the Weinbrunnen for the Stahlbrunnen (eight ounces twice a day), the constipation having ceased, she left Schwalbach in good health. Her attendant physician told me afterwards that the menstruation had become quite normal without pains, though a little more copious than before her marriage. Six months after her sojourn in Schwalbach Mrs. H. became pregnant again and after a normal pregnancy was confined without any difficulty and has since been well.

II. C A S E.

Mrs. D., four years ago, lost an abundant quantity of blood during child-birth in consequence of placenta praevia. Her womb has since remained in a state of subinvolution and atony. In the course of the two years following this accident, her pregnancy has twice been interrupted at the end of the fourth month, by abortions complicated with violent metrorrhagias. The last abortion took place in the month of November 1871, and since that time her anemic state has

been increased by very profuse and painful menstruations returning at the regular time, though all kind of tonics have been used. Therefore she was not able to get out of her bed during the whole winter of 1871/72. Examining her genital organs, I found the uterus swollen and heavy in a state of retroversion. The fluor albus uterinus was thick. The genital parts did not show any abnormal irritability. The treatment began in removing the uterine secretion from time to time. Then twenty-eight baths joined to cool injections were taken and the Stahlbrunnen-water used internally for five weeks. The size of the womb was reduced to its normal dimensions and its walls regained their normal tone, and likewise the whole system appeared stronger.

When she began to menstruate for a second time at Schwalbach, menses were less than formerly and quite painless. Afterwards in the month of December 1872 she became pregnant and having cautiously past the third, fourth and fifth month in bed, she was happily delivered.

4. DISEASES CAUSED BY ALTERATIONS OF THE POSITION OF THE WOMB OR BY GRAVE DEGENERATIONS OF ITS WALLS.

a) Of the alterations of the position of the uterus, I have already mentioned the two most frequent forms; namely, the versiones and flexiones uteri as being caused by subinvolution. The *descensus*, *prolapsus* and *inversio* uteri, though their cure can only

be accomplished by surgical treatment, are constantly complicated by great irritation of the sexual nerves and always reduce the patients to a most anemic state.

This and the good effect, which I saw upon the loosened and atonic tissue of the vagina (which is an important supporter of the uterus) from the treatment in Schwalbach, especially from strengthening sitz-baths and cool injections induce me to recommend them against these diseases.

b) *Metritis chronica* causing not only local pains but general weakness and infirmity very often requires iron-remedies; which must be avoided as long as there exists any local congestion of the sexual organs.

Finally, I will mention the decrease of strength produced by those *tumors*, which issue from the uterine walls or are lying in them, namely mucous and fibrous polypes or fibroids, fixed in the wall of the womb. All these must be removed before any help may be hoped from the use of our springs.

5. ALTERATIONS OF HEALTH ARISING FROM CHILD-BIRTH AND ABORTIONS, FOLLOWING EACH OTHER IN TOO SHORT INTERVALS.

As I have said, while discussing the different kinds of the abnormal menstruation, in the course of every gravidity the system is deprived of a great amount of its strength and energy by the loss of many cellular constituents of the blood.

Now a great many women have to undergo this loss, sometimes even from their sixteenth year, not once but three, four or more times, and the greater part of them suffer very much from protracted and repeated lactation, exhausting them not only by the loss of matter itself, but also by the tireful night-watchings. All of them, moreover have to bear great bodily and spiritual anxieties and cares, which vex a mother during the numerous diseases to which her children are exposed: If we sum up all these weakening influences, can we be astonished, that a proportionally great number of married women pine away more or less rapidly, consumed by a sickness, which bears all the characteristic signs of anemia?

Sometimes and not unfrequently the already discussed bad results of pregnancies following each other too quickly and too frequently are complicated by miscarriages, which naturally affect both body and spirits in a high degree. The infirmity, which results from all these concurring influences, is more frequent than one would suppose: And it is the more dangerous, the nearer a woman is to that age, when her menstruation is beginning to cease, because this age offers a frequent predisposition to carcinomatous cachexia.

A quick and complete supply of strength required by these cases of disease and weakness is furnished by a repeated sojourn in our valley; its refreshing baths, its powerful springs furnishing to the system

the necessary amount of iron, its charming situation, its fresh mountain-air, the abundant woods surrounding it, happily concur to cure those invalids, who, treated at home in the midst of their daily occupations and sorrows, never would recover.

THE END.


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